

ABSTRACT

Methods and apparatus are provided for rapidly moving a filter into and out of an optical beam. A shuttle carries the filter at a first end and first and second spaced apart pieces of magnetic material near the other end. A low friction guide-way supports the shuttle. A base supports the guide-way and a third magnetic piece and coil between the first and second pieces. When the shuttle is IN the first and third pieces form a first magnetic latch to releasably hold it IN and when the shuttle is OUT the second and third pieces form a second magnetic latch to releasably hold it OUT. Spring(s) between the shuttle and the base store energy when the shuttle is IN or OUT. Activating the coil weakens the magnetic attraction between the latch pieces, freeing the shuttle to move, driven by the spring(s) to the opposite OUT or IN position.